ANNUAL REPORT 1964

MEAFORD

water treatment plant

DIVISION OF PLANT OPERATIONS

Ontario Water Resources Commission

ONTARIO WATER RESOURCES COMMISSION

OFFICE OF THE GENERAL MANAGER

Members of the Meaford Local Advisory Committee,
Town of Meaford.

Gentlemen:

We are pleased to provide you with the 1964 Operating Report for the Meaford Water Treatment Plant, OWRC Project No. 59-W-29.

By continuing the mutual cooperation which has existed in the past, we can look forward to greater progress in the field of water supply.

Yours very truly,

D. S. Caverly, P. Eng.
General Manager

MOE
MEA
1964
ATJH

General Manager,
Ontario Water Resources Commission.

Dear Sir:

It is with pleasure that I present to you the Annual Report of the operation of the Meaford Water Treatment Plant, OWRC Project No. 59-W- 29 for 1964.

This report presents design data, outlines operating problems encountered and summarizes in tables, charts and graphs all significant flow and cost data.

Yours very truly,

B C Palmer

B. C. Palmer, P. Eng.,
Director,
Division of Plant Operations.

FOREWORD

This report describes the operation of this project for the year 1964. It includes a detailed description of the project, summary of operation, graphs and charts showing quality and quantity information, and project cost data.

This information will be of value to the municipality in assessing the adequacy of the works in meeting existing requirements and in projecting its capability to meet future expected demands. The cost information will be of particular interest to those concerned with developing and maintaining revenue structures.

The preparation of this report has been a cooperative effort of several groups within the Division of Plant Operations. These include the Statistical Section, Brochures Officer and the Regional Supervisor. However, the primary responsibility for the content has been with the Regional Operations Engineer. He will be pleased to discuss all aspects of this report with the municipality.

B. C. Palmer, P. Eng.,
Director,
Division of Plant Operations.

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MEAFORD
water treatment plant

operated by

THE TOWN OF MEAFORD

and by the

ONTARIO WATER RESOURCES COMMISSION

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W. S. MacDonnell

DIVISION OF PLANT OPERATIONS

DIRECTOR: B. C. Palmer

Assistant Director: C. W. Perry
Regional Supervisor: A. C. Beattie
Operations Engineer: A. Clark

801 Bay Street Toronto 5

'64 REVIEW

This report gives in detail the significant data of the operation of the Meaford Water Treatment Plant.

The average flow for 1964 was 1.04 million gallons per day and the maximum month, July, average was 1.34 mgd.

Operating costs described in this report covers only Equipment, Repairs and Maintenance and Sundry, all other costs are borne directly by the Town of Meaford.

GLOSSARY

BOD	biochemical oxygen demand (a measure of organic content)
cfm	cubic feet per minute
comminution	shredding of solids into small fragments
DWF	dry weather flow
effluent	outflow
flocculation	bringing very small particles together to form a larger mass (the floc) before settling
fps	feet per second
gpcd	gallons per capita per day
gpm	gallons per minute
grit	sand, dust, stones, cinders and other heavy inorganic material
influent	inflow
lin. ft.	lineal feet
mgd	million gallons per day
mlss	mixed liquor suspended solids
ppm	parts per million
ss	suspended solids
TDH	total dynamic head (usually refers to pressure on a pump when it is in operation)

HISTORY
1957 - 1964

In 1957, the Town of Meaford and the Ontario Water Resources Commission initiated plans for the construction of a modern water treatment plant. The firm of Philips and Roberts Limited, Consulting Engineers of Brantford, Ontario was engaged to prepare plans and specifications for the project.

APPROVAL

In March 1959, the municipality signed an agreement with the Ontario Water Resources to finance, construct, and operate a water treatment plant.

CONSTRUCTION

Pearce Construction Company Limited was awarded the contract and the project was officially opened on August 23, 1961.

TOTAL COST

The total cost of the project was $483,129.09.

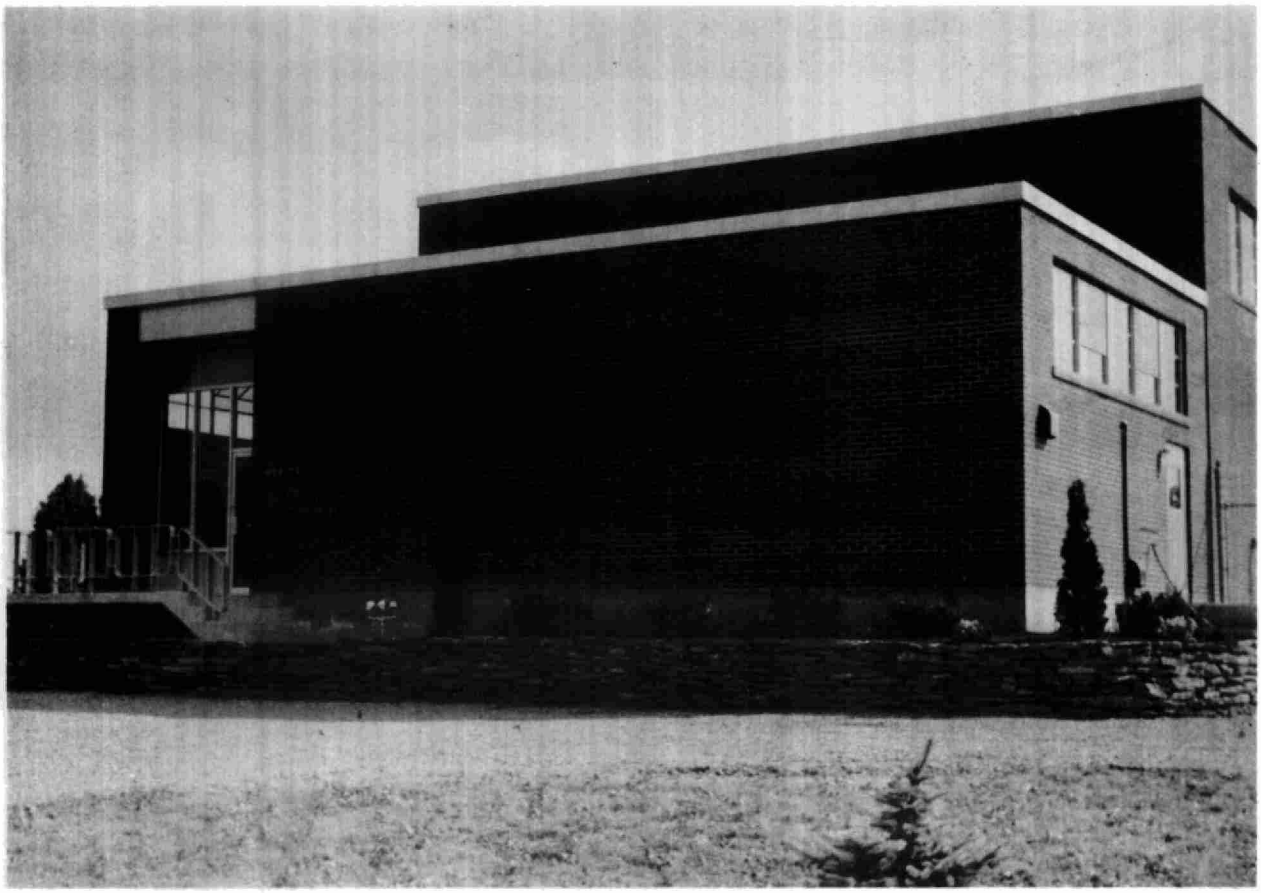
Project Staff

Murray Cook, Chief Operator

COMMENTS

The Meaford Water Treatment Plant and the water supply system are operated by the Meaford Public Utilities Commission. The man responsible for the operation is Murray Cook.

Mr. Cook has operated the plant since 1961, in February 1963, he completed the Ontario Water Resources Commission course for Water Works Operators. His operation of the plant has been most satisfactory.



MEAFORD WATER TREATMENT PLANT

Description of Project

GENERAL

Meaford Water Treatment Plant consists of a 30 inch gravity water intake 870 ft. long, low lift pumping station, filtration plant, clear water reservoir, high lift pumping station, and 6000 ft. of 16 inch transmission main from the high lift pumping station to the center of the existing distribution system.

INTAKE

The gravity intake line delivers raw water from Georgian Bay to the intake well where it is pumped by two 2100 IGPM vertical turbine Fairbanks-Morse pumps, to the filtration plant. The raw water is chlorinated in the low lift transmission main before it reaches the filter beds. The filter beds are 25 feet square and contain graded anthrafilt which is supported on a Miller Block underdrain system. The rated capacity of each filter is 1.5 mgd and can accomodate 2.0 mgd for short periods of time should the need arise.

FILTER CONTROL

The filter control valves are all hydraulically operated by means of four way valves in each filter operating console located on the operating floor. The filters are backwashed by using a vertical propeller type pump with a capacity of 6500 IGPM. The backwashing cycle is performed to remove the foreign materials which have been filtered from the water.

PUMPING

The filtered water is stored below the filtration plant and pumping station in a clear water reservoir which has a capacity of 200,000 gallons. The filtered water is pumped from the reservoir by two horizontal centrifugal pumps with a combined capacity of 2600 IGPM and are located in the high lift pumping station.

CONTROL PANEL

The entire operation of low lift pumping, filtration, chlorination, backwashing, and high lift pumping is controlled by a central control panel located in the main office in the high lift pumping station. The operation of each essential component of the water system is indicated and recorded on the central panel and a visual inspection will indicate if the plant operation is satisfactory.

PROJECT COSTS

LONG TERM DEBT: (Total Capital Cost)	$483,129.00

The total cost to the municipality during 1964 was as follows:

Net Operating	$ 11,793.29
Debt Retirement	12,822.00
Reserve	3,660.00
Interest Charged	27,178.90
TOTAL	$ 55,454.19

RESERVE ACCOUNT

Balance at January 1, 1964	$ 11,558.59
Deposited by municipality	3,660.00
Interest Earned	714.89
	$ 15,933.48
Less Expenditures	512.43
Balance at December 1, 1964	$ 15,421.05

DEBT OUTSTANDING:	$427,436.60

MONTHLY COSTS

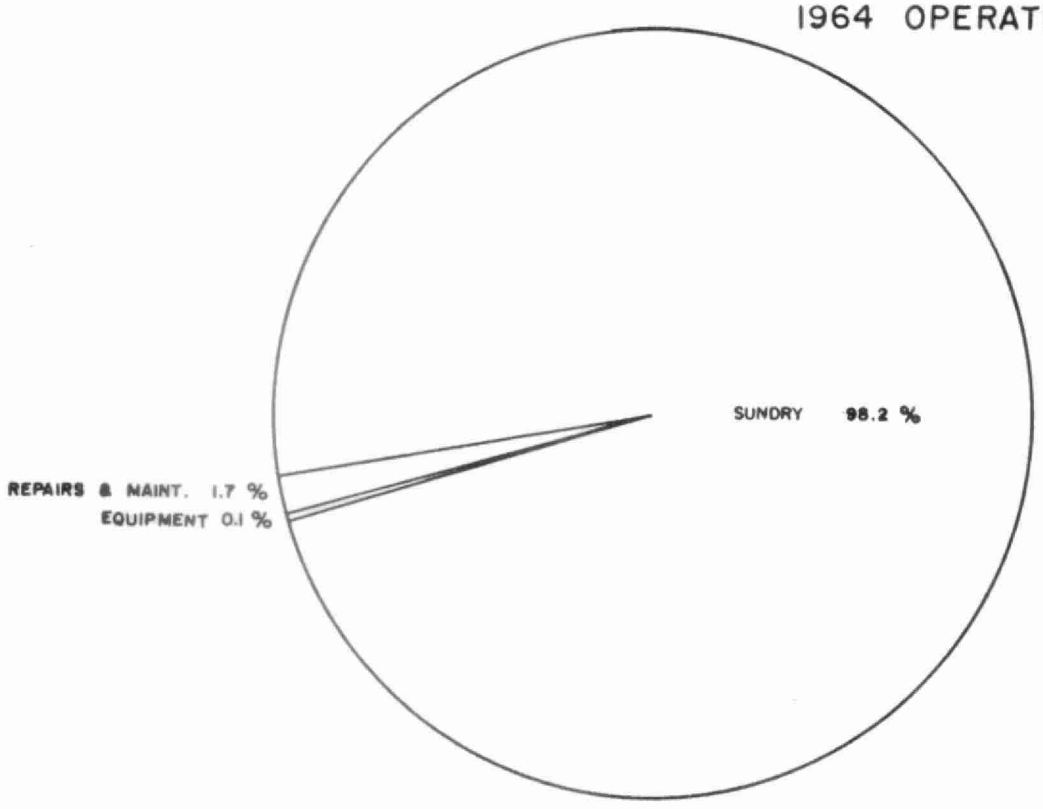
MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	SUNDRY
JAN										
FEB	958.81									958.81
MARCH	1358.94									1358.94
APRIL	15.73							15.73		
MAY	1662.93									1662.93
JUNE	897.05									897.05
JULY	3017.42									3017.42
AUG	84.98								84.98	
SEPT	1124.27									1124.27
OCT	664.63								112.85	551.78
NOV										
DEC	2008.53									2008.53
TOTAL	11793.29							15.73	197.83	11579.73

BRACKETS INDICATE CREDIT

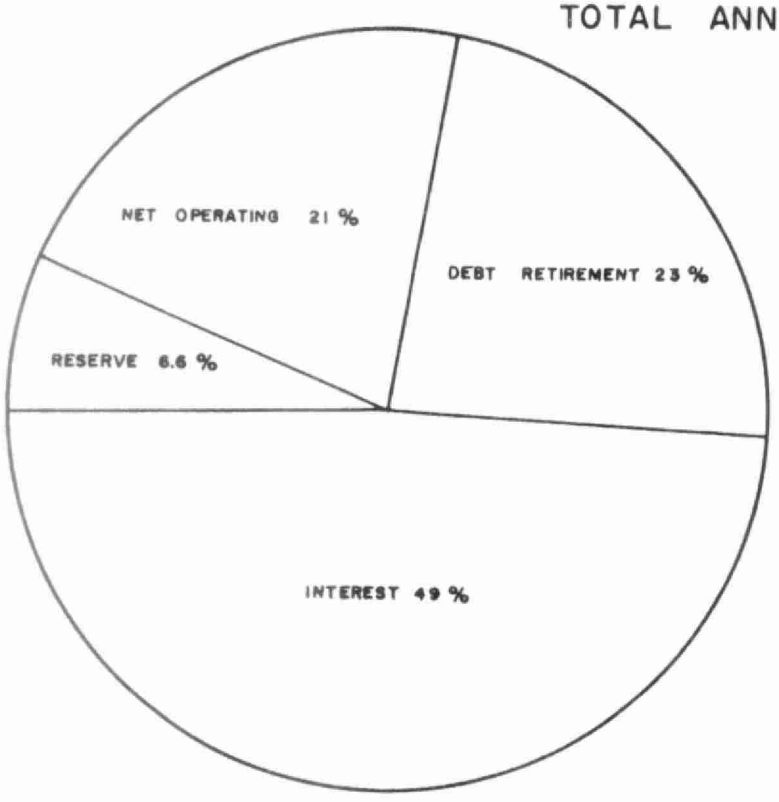
YEARLY COSTS

YEAR	M.G. TREATED	TOTAL COST	COST PER FAMILY PER YEAR	COST PER MILLION GALLONS
1964	381.236	$11,793.29	$11.97	$30.93

1964 OPERATING COSTS

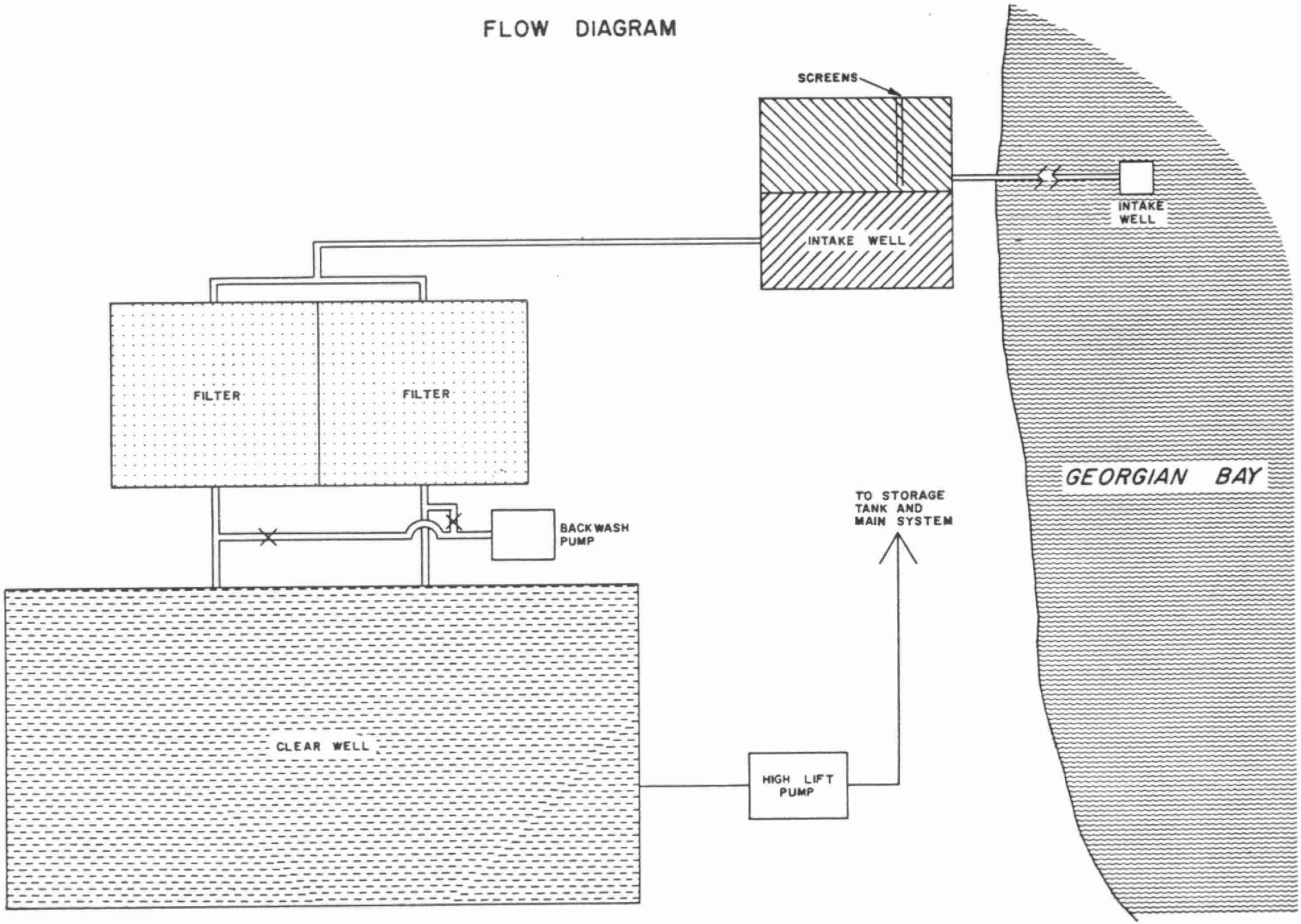


TOTAL ANNUAL COST



Technical Section

FLOW DIAGRAM



Design–Data

GENERAL

Type of Plant - Rapid sand filter

Source of Raw Water - Georgian Bay

INTAKE

Size 30 inches
Length - 850 feet
Depth of water at intake head - 20 ft.
Type of Pipe - Hyprescon Reinforced concrete.

LOW LIFT PUMPS

Number 2
Capacity Low Lift Pump No. 1 - 2100 IGPM
Low Lift Pump No. 2 - 2100 IGPM
Total Capacity - 4200 IGPM
Operating Head - 50 feet
Type - Vertical turbine
Manufacturer - Canadian Fairbanks-Morse
Auxiliary Power - Low Lift Pump No. 2, Chrysler Industrial Engine.

HIGH LIFT PUMPS

Number 2
Capacity - High Lift Pump No. 1 - 1170 IGPM
High Lift Pump No. 2 - 2000 IGPM
Total Capacity - 2600 IGPM
Operating Head - High Lift Pump No. 1 172 feet
High Lift Pump No. 2 - 180 feet
Type - Centrifugal
Manufacturer - High Lift Pump No. 1 - Fairbanks-Morse.

High Lift Pump No. 2 - Delaval
Auxiliary Power - High Lift Pump No. 2 G. M. C. Diesel.

BACKWASH PUMP

Number 1
Capacity - High Lift Pump No. 1 6500 IGPM
Operating Head - 38 feet
Type - Propelled
Manufacturer - Canadian Fairbanks-Morse.

CHLORINATOR

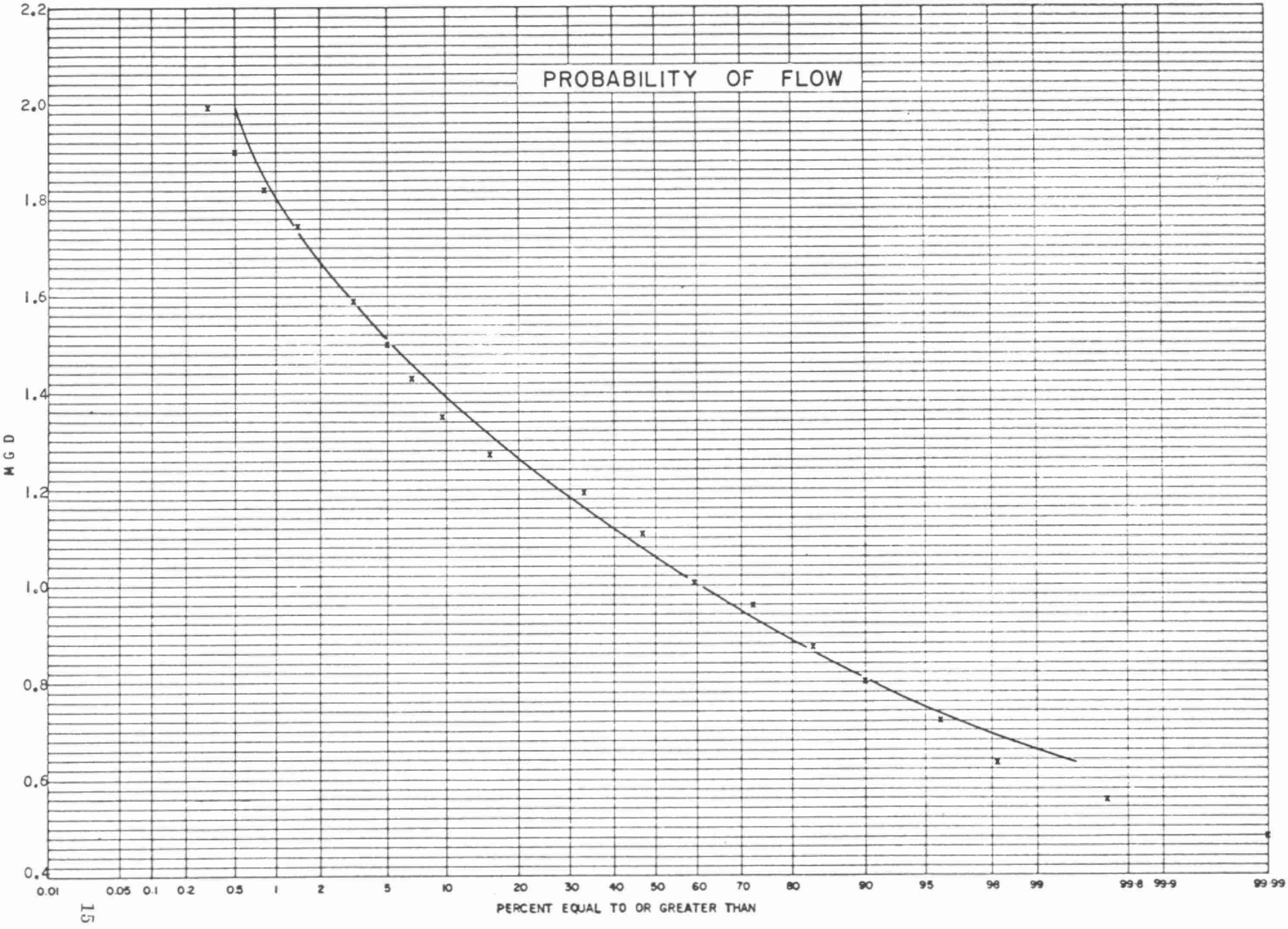
Number 1
Type - Chlorine Gas
Manufacturer - Fisher Porter
Range - 0 to 20 and 0 to 40 pounds per day.

FILTERS

Number 2
Size - 25 feet x 25 feet
Nominal Capacity - 1.5 MIGD each
Total Capacity - 3.0 MIGD
Filter Media - graded anthrafilt under-drains
Surface Wash - Palmer agitators.

CLEARWELL RESERVOIR

Capacity - 200,000 Imperial Gallons.


PROBABILITY OF FLOW
MGD
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.01
0.05
0.1
0.2
0.5
1
2
5
10
20
30
40
50
60
70
80
90
95
98
99
99.8
99.9
99.99
PERCENT EQUAL TO OR GREATER THAN

MGD
0.5
0.6
0.7
0.8
0.9
1.0
1.1
1.2
1.3
1.4
1.5
19 64
JAN.
FEB.
MAR.
APR.
MAY.
JUNE
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AUG.
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DEC.
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MAY.
JUNE
JULY
AUG.
SEPT.
OCT.
NOV.
DEC.
AVERAGE DAILY FLOW

TURBIDITY

Month	Raw Water	Filtered Water
January	1.8	1.2
February	1.5	1.0
March	2.9	1.6
April	1.6	1.1
May	1.6	1.1
June	1.6	1.0
July	1.9	1.1
August	2.2	1.2
September	1.6	1.0
October	1.5	1.0
November	1.7	1.1
December	3.0	1.6

CHLORINATION

MONTH	PLANT FLOW (MG)	POUNDS CHLORINE	DOSAGE RATE (PPM)
JANUARY	27.282	* 268.4	0.98
FEBRUARY	24.333	196.0	0.80
MARCH	26.369	224.0	0.85
APRIL	29.708	238.0	0.80
MAY	32.165	249.0	0.77
JUNE	39.943	308.0	0.77
JULY	41.565	389.0	0.94
AUGUST	30.567	281.5	0.92
SEPTEMBER	33.207	279.0	0.84
OCTOBER	33.473	267.0	0.80
NOVEMBER	30.269	257.5	0.85
DECEMBER	32.355	263.5	0.81
TOTAL	381.236	3220.9	
AVERAGE	31.770	268.4	0.84

* value prorated


ONTARIO WATER RESOURCES COMMISSION